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**Light weight structural beam**

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## A B S T R A C T

The item is a light weight, yet structural, beam. Its form is characterised by a series of circular voids along its length.

There is substantially less body material in it than other structural beams.

It is lighter, stronger and more simple to build in. Its shape does not confine it to any single type of structure.

Unlike other beams, it may be incorporated into almost any structure.

It readily improves upon, and substitutes for, more bulky existing construction components.

Reference features are listed below, using the accompanying illustration of one example of the invention.

1. The voids so formed in the assembly.
2. The flanges of the structural beam.
3. The punched or drilled holes at intervals along the beam.

LIGHT WEIGHT BEAM



3. Holes provided at intervals along the flanges.

1. The voids formed in the assembly.

3. Holes provided at intervals along the flanges.

2.  
The flanges of the structural beam.

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## EDITORIAL NOTE

There are 3 pages of description including the cover page.

AUSTRALIA  
*Patents Act 1990*

**COMPLETE SPECIFICATION  
INNOVATION PATENT**

**LIGHT WEIGHT BEAM**

The following statement is a full  
description of this invention and applications:

## LIGHT WEIGHT BEAM

This invention relates to a method of assembling, the selection of material in, the processing, the form of, a manufactured structural beam, and its application.

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In many areas and methods of construction in building, engineering and manufacture, the use of heavy components to carry material loads and weights is undesirable.

Undesirable features include high purchase price, heavy weight, difficult handling, awkward processing and poor workability.

The present invention creates a means to avoid these undesirable features.

It also provides a different method and component to those addressed in paras. 2 & 3 above.

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The invention uses pre formed "C" shaped thin gauge light steel shapes rivet-pinned back-to-back to produce an "I" shaped beam.

These simple thin gauge "C" shapes are of such form and dimension that, taken individually, they have no significant strength characteristic, and there is no purpose as a structural component in a building. In heavier gauge they will.

Circular voids are formed in this assembly to substantially reduce it to a weight much lighter than the component material.

The assembly has an intrinsic strength. This is still retained in its now light weight form.

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The beam is lighter than the hot rolled steel, pressed steel, folded steel or timber beams usually employed in building construction, so its strength-to-weight features provide a superior usage in structures.

These uses may be as lintel, joist, rafter and for any other structural component where the property of strength with light weight is preferred.

Holes are provided at intervals along the flanges in order to create quicker and easier fixing to adjoining parts, and to components of a structure.

These holes be positioned, and of such a size, to allow the use of speed fasteners.

The easy fixing facility thus provided now utilises adjacent structural components such as timber; and thereby creates a composite structure of lighter weight and superior strength even, than the abovementioned invented beam itself.

The flanges at top and bottom of the beam can be fixed along a timber or metal adjacent component.

The composition achieved is superior in weight and strength. It enhances the structural performance of a building.

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In one form of the invention, the shape of the voids formed may be hexagonal, octagonal or in a segmental pattern.

In another, the voids may be square or rectangular.

In another, the depth of the beam may be increased or reduced.

In still another, the guage of the steel "C" shapes may be thicker or thinner. Metal other than steel may be used.

The invention may be assembled by pinning back-to-back using spot or strip welding, screws, and by pressed or punched metal locking.

## CLAIMS DEFINING THE INVENTION ARE:

1. A metal structural beam of thin gauge material, having a regular pattern of large voids, significantly lighter than any other known metal beam of the same dimensions, and appearing in the shape of an "I".
2. A beam in Claim 1, having circular voids formed along its length.
3. A beam in Claim 1, constructed by joining two or more components.
4. A beam in Claim 1, of gauge material not exceeding 3.7mm.
5. A beam appearing similar to the attached illustration.

APPLICANT

13 AUGUST 2004



William Malcolm Firth

## EDITORIAL NOTE

There is 1 page of drawings.

Reference features are listed below, using the accompanying illustration of one example of the invention.

1. The voids so formed in the assembly.
2. The flanges of the structural beam.
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LIGHT WEIGHT BEAM



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